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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/770,413	02/04/2004	Norio Hasegawa	501.39158CX1	1925

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EXAMINER

CHACKO DAVIS, DABORAH

ART UNIT PAPER NUMBER

1756

DATE MAILED: 03/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/770,413

Applicant(s)

HASEGAWA ET AL.

Examiner

Daborah Chacko-Davis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>02/04</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-18, are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent No. 6,327,022 (Nishi) in view of U. S. Patent No. 5,532,114 (Bae).

Nishi, in col 6, lines 48-67, in col 7, lines 1-11, in col 15, lines 20-24, in col 23, lines 6-10, discloses an exposure method of performing a first exposure on a photosensitive substrate (photoresist-coated substrate), through a first reticle (first mask), using UV light to form a first pattern (first mask pattern), performing a second exposure on the exposed substrate, through a second reticle, using UV light to form a second pattern. Nishi, in col 4, lines 25-30, in col 24, lines 49-65, discloses that reticle comprises hole patterns, line patterns etc. Nishi, in col 15, lines 20-24, and in col 30, lines 65-67, in col 31, lines 1-10, discloses that the first and second exposures are scanning exposure processes. Nishi, in col 8, lines 1-14, in col 23, lines 6-6-9, discloses that the light system is a reduction projection system, and that illumination is deformed (light transmitted is deformed) and the patterns formed lack resolution (defects in masks) (claims 1-2, 4, 6-8, 10, 12-14, 16, and 18). Nishi, in col 19, lines 4-25, discloses that the illumination pattern is projected obliquely with respect to the optical axis (claims 5, 11, and 17).

The difference between the claims and Nishi is that Nishi does not disclose that the reticles are phase-shifting masks and that the phase of the second phase shift mask is inverted from that of the first phase shift mask. Nishi does not disclose that the first and second phase shift masks have a substrate groove shifter (claims 3, 9, and 15).

Bae, in col 1, lines 38-62, discloses the use of first and second phase shift masks in the first and second exposure processes, wherein the phase shift masks also include shifters (phase shift pattern) formed on the mask substrate. Bae, in col 1, lines 58-62, discloses that the phase of the second phase shift mask is inverse to the phase of the first phase shift mask

Therefore, it would be obvious to a skilled artisan to modify Nishi by employing the phase shift masks suggested by Bae, because Bae, in col 4, lines 26-39, and lines 45-49, discloses that employing phase shifting photomasks with inverse phases to each other results in an intensity distribution curve having excellent contrast enabling the formation of ultra micro pattern beyond the limitation of the resolution power obtainable by an ordinary stepper.

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daborah Chacko-Davis whose telephone number is (571) 272-1380. The examiner can normally be reached on M-F 9:30 - 6:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's

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supervisor, Mark F Huff can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

dcd



March 21, 2005.



JOHN A. MCPHERSON
PRIMARY EXAMINER